#2
ENTERED   OIPE

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   3 <110> APPLICANT: Makielski, Jonathan C
   4        Ye, Bin
   6 <120> TITLE OF INVENTION: Sodium Channel Alpha Subunits
   8 <130> FILE REFERENCE: 960296.98032
C--> 10 <140> CURRENT APPLICATION NUMBER: US/10/077,054
C--> 11 <141> CURRENT FILING DATE: 2002-02-12
  13 <160> NUMBER OF SEQ ID NOS: 10
  15 <170> SOFTWARE: PatentIn Ver. 2.1
  17 <210> SEQ ID NO: 1
  18 <211> LENGTH: 6091
  19 <212> TYPE: DNA
  20 <213> ORGANISM: Homo sapiens
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  31 agg ttc aca cgg gag tcc ctg gca gcc atc gag aag cgc atg gcg gag  99
  32 Arg Phe Thr Arg Glu Ser Leu Ala Ala Ile Glu Lys Arg Met Ala Glu
  33  15               20                  25                  30
  35 aag caa gcc cgc ggc tca acc acc ttg cag gag agc cga gag ggg ctg  147
  36 Lys Gln Ala Arg Gly Ser Thr Thr Leu Gln Glu Ser Arg Glu Gly Leu
  37                  35                  40                  45
  39 ccc gag gag gag gct ccc cgg ccc cag ctg gac ctg cag gcc tcc aaa  195
  40 Pro Glu Glu Glu Ala Pro Arg Pro Gln Leu Asp Leu Gln Ala Ser Lys
  41                  50                  55                  60
  43 aag ctg cca gat ctc tat ggc aat cca ccc caa gag ctc atc gga gag  243
  44 Lys Leu Pro Asp Leu Tyr Gly Asn Pro Pro Gln Glu Leu Ile Gly Glu
  45              65                  70                  75
  47 ccc ctg gag gac ctg gac ccc ttc tat agc acc caa aag act ttc atc  291
  48 Pro Leu Glu Asp Leu Asp Pro Phe Tyr Ser Thr Gln Lys Thr Phe Ile
  49      80                  85                  90
  51 gta ctg aat aaa ggc aag acc atc ttc cgg ttc agt gcc acc aac gcc  339
  52 Val Leu Asn Lys Gly Lys Thr Ile Phe Arg Phe Ser Ala Thr Asn Ala
  53  95               100                 105                 110
  55 ttg tat gtc ctc agt ccc ttc cac ccc atc cgg aga gcg gct gtg aag  387
  56 Leu Tyr Val Leu Ser Pro Phe His Pro Ile Arg Arg Ala Ala Val Lys
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  59 att ctg gtt cac tcg ctc ttc aac atg ctc atc atg tgc acc atc ctc  435
  60 Ile Leu Val His Ser Leu Phe Asn Met Leu Ile Met Cys Thr Ile Leu
  61                 130                 135                 140
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63 acc aac tgc gtg ttc atg gcc cag cac gac cct cca ccc tgg acc aag   483
64 Thr Asn Cys Val Phe Met Ala Gln His Asp Pro Pro Pro Trp Thr Lys
65         145                 150                 155
67 tat gtc gag tac acc ttc acc gcc att tac acc ttt gag tct ctg gtc   531
68 Tyr Val Glu Tyr Thr Phe Thr Ala Ile Tyr Thr Phe Glu Ser Leu Val
69         160                 165                 170
71 aag att ctg gct cga ggc ttc tgc ctg cac gcg ttc act ttc ctt cgg   579
72 Lys Ile Leu Ala Arg Gly Phe Cys Leu His Ala Phe Thr Phe Leu Arg
73 175             180                 185                     190
75 gac cca tgg aac tgg ctg gac ttt agt gtg att atc atg gca tac aca   627
76 Asp Pro Trp Asn Trp Leu Asp Phe Ser Val Ile Ile Met Ala Tyr Thr
77             195                 200                 205
79 act gaa ttt gtg gac ctg ggc aat gtc tca gcc tta cgc acc ttc cga   675
80 Thr Glu Phe Val Asp Leu Gly Asn Val Ser Ala Leu Arg Thr Phe Arg
81         210                 215                 220
83 gtc ctc cgg gcc ctg aaa act ata tca gtc att tca ggg ctg aag acc   723
84 Val Leu Arg Ala Leu Lys Thr Ile Ser Val Ile Ser Gly Leu Lys Thr
85         225                 230                 235
87 atc gtg ggg gcc ctg atc cag tct gtg aag aag ctg gct gat gtg atg   771
88 Ile Val Gly Ala Leu Ile Gln Ser Val Lys Lys Leu Ala Asp Val Met
89         240                 245                 250
91 gtc ctc aca gtc ttc tgc ctc agc gtc ttt gcc ctc atc ggc ctg cag   819
92 Val Leu Thr Val Phe Cys Leu Ser Val Phe Ala Leu Ile Gly Leu Gln
93 255             260                 265                     270
95 ctc ttc atg ggc aac cta agg cac aag tgc gtg cgc aac ttc aca gcg   867
96 Leu Phe Met Gly Asn Leu Arg His Lys Cys Val Arg Asn Phe Thr Ala
97             275                 280                 285
99 ctc aac ggc acc aac ggc tcc gtg gag gcc gac ggc ttg gtc tgg gaa   915
100 Leu Asn Gly Thr Asn Gly Ser Val Glu Ala Asp Gly Leu Val Trp Glu
101            290                 295                 300
103 tcc ctg gac ctt tac ctc agt gat cca gaa aat tac ctg ctc aag aac   963
104 Ser Leu Asp Leu Tyr Leu Ser Asp Pro Glu Asn Tyr Leu Leu Lys Asn
105            305                 310                 315
107 ggc acc tct gat gtg tta ctg tgt ggg aac agc tct gac gct ggg aca  1011
108 Gly Thr Ser Asp Val Leu Leu Cys Gly Asn Ser Ser Asp Ala Gly Thr
109            320                 325                 330
111 tgt ccg gag ggc tac cgg tgc cta aag gca ggc gag aac ccc gac cac  1059
112 Cys Pro Glu Gly Tyr Arg Cys Leu Lys Ala Gly Glu Asn Pro Asp His
113 335            340                 345                     350
115 ggc tac acc agc ttc gat tcc ttt gcc tgg gcc ttt ctt gca ctc ttc  1107
116 Gly Tyr Thr Ser Phe Asp Ser Phe Ala Trp Ala Phe Leu Ala Leu Phe
117            355                 360                 365
119 cgc ctg atg acg cag gac tgc tgg gag cgc ctc tat cag cag acc ctc  1155
120 Arg Leu Met Thr Gln Asp Cys Trp Glu Arg Leu Tyr Gln Gln Thr Leu
121            370                 375                 380
123 agg tcc gca ggg aag atc tac atg atc ttc ttc atg ctt gtc atc ttc  1203
124 Arg Ser Ala Gly Lys Ile Tyr Met Ile Phe Phe Met Leu Val Ile Phe
125            385                 390                 395
127 ctg ggg tcc ttc tac ctg gtg aac ctg atc ctg gcc gtg gtc gca atg  1251
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RAW SEQUENCE LISTING   DATE: 03/04/2002
PATENT APPLICATION: US/10/077,054 TIME: 14:55:07

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Output Set: **N:\CRF3\03042002\J077054.raw**

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132 Ala Tyr Glu Glu Gln Asn Gln Ala Thr Ile Ala Glu Thr Glu Glu Lys
133 415             420             425             430
135 gaa aag cgc ttc cag gag gcc atg gaa atg ctc aag aaa gaa cac gag     1347
136 Glu Lys Arg Phe Gln Glu Ala Met Glu Met Leu Lys Lys Glu His Glu
137             435             440             445
139 gcc ctc acc atc agg ggt gtg gat acc gtg tcc cgt agc tcc ttg gag     1395
140 Ala Leu Thr Ile Arg Gly Val Asp Thr Val Ser Arg Ser Ser Leu Glu
141             450             455             460
143 atg tcc cct ttg gcc cca gta aac agc cat gag aga aga agc aag agg     1443
144 Met Ser Pro Leu Ala Pro Val Asn Ser His Glu Arg Arg Ser Lys Arg
145             465             470             475
147 aga aaa cgg atg tct tca gga act gag gag tgt ggg gag gac agg ctc     1491
148 Arg Lys Arg Met Ser Ser Gly Thr Glu Glu Cys Gly Glu Asp Arg Leu
149             480             485             490
151 ccc aag tct gac tca gaa gat ggt ccc aga gca atg aat cat ctc agc     1539
152 Pro Lys Ser Asp Ser Glu Asp Gly Pro Arg Ala Met Asn His Leu Ser
153 495             500             505             510
155 ctc acc cgt ggc ctc agc agg act tct atg aag cca cgt tcc agc cgc     1587
156 Leu Thr Arg Gly Leu Ser Arg Thr Ser Met Lys Pro Arg Ser Ser Arg
157             515             520             525
159 ggg agc att ttc acc ttt cgc agg cga gac ctg ggt tct gaa gca gat     1635
160 Gly Ser Ile Phe Thr Phe Arg Arg Arg Asp Leu Gly Ser Glu Ala Asp
161             530             535             540
163 ttt gca gat gat gaa aac agc aca gcg ggg gag agc gag agc cac cgc     1683
164 Phe Ala Asp Asp Glu Asn Ser Thr Ala Gly Glu Ser Glu Ser His Arg
165             545             550             555
167 aca tca ctg ctg gtg ccc tgg ccc ctg cgc cgg acc agt gcc cag gga     1731
168 Thr Ser Leu Leu Val Pro Trp Pro Leu Arg Arg Thr Ser Ala Gln Gly
169     560             565             570
171 cag ccc agt ccc gga acc tcg gct cct ggc cac gcc ctc cat ggc aaa     1779
172 Gln Pro Ser Pro Gly Thr Ser Ala Pro Gly His Ala Leu His Gly Lys
173 575             580             585             590
175 aag aac agc act gtg gac tgc aat ggg gtg gtc tca tta ctg ggg gca     1827
176 Lys Asn Ser Thr Val Asp Cys Asn Gly Val Val Ser Leu Leu Gly Ala
177             595             600             605
179 ggc gac cca gag gcc aca tcc cca gga agc cac atc ctc cgc cct gtg     1875
180 Gly Asp Pro Glu Ala Thr Ser Pro Gly Ser His Ile Leu Arg Pro Val
181             610             615             620
183 atg cta gag cac ccg cca gac acg acc acg cca tcg gag gag cca ggc     1923
184 Met Leu Glu His Pro Pro Asp Thr Thr Thr Pro Ser Glu Glu Pro Gly
185             625             630             635
187 ggg ccc cag atg ctg acc tcc cag gct ccg tgt gta gat ggc ttc gag     1971
188 Gly Pro Gln Met Leu Thr Ser Gln Ala Pro Cys Val Asp Gly Phe Glu
189     640             645             650
191 gag cca gga gca cgg cag cgg gcc ctc agc gca gtc agc gtc ctc acc     2019
192 Glu Pro Gly Ala Arg Gln Arg Ala Leu Ser Ala Val Ser Val Leu Thr
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RAW SEQUENCE LISTING   DATE: 03/04/2002
PATENT APPLICATION: US/10/077,054   TIME: 14:55:07

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199 tgg aac cgt ctc gcc cag cgc tac ctg atc tgg gag tgc tgc ccg ctg    2115
200 Trp Asn Arg Leu Ala Gln Arg Tyr Leu Ile Trp Glu Cys Cys Pro Leu
201              690                  695                  700
203 tgg atg tcc atc aag cag gga gtg aag ttg gtg gtc atg gac ccg ttt    2163
204 Trp Met Ser Ile Lys Gln Gly Val Lys Leu Val Val Met Asp Pro Phe
205              705                  710                  715
207 act gac ctc acc atc act atg tgc atc gta ctc aac aca ctc ttc atg    2211
208 Thr Asp Leu Thr Ile Thr Met Cys Ile Val Leu Asn Thr Leu Phe Met
209      720                  725                  730
211 gcg ctg gag cac tac aac atg aca agt gaa ttc gag gag atg ctg cag    2259
212 Ala Leu Glu His Tyr Asn Met Thr Ser Glu Phe Glu Glu Met Leu Gln
213 735                  740                  745                  750
215 gtc gga aac ctg gtc ttc aca ggg att ttc aca gca gag atg acc ttc    2307
216 Val Gly Asn Leu Val Phe Thr Gly Ile Phe Thr Ala Glu Met Thr Phe
217              755                  760                  765
219 aag atc att gcc ctc gac ccc tac tac tac ttc caa cag ggc tgg aac    2355
220 Lys Ile Ile Ala Leu Asp Pro Tyr Tyr Tyr Phe Gln Gln Gly Trp Asn
221              770                  775                  780
223 atc ttc gac agc atc atc gtc atc ctt agc ctc atg gag ctg ggc ctg    2403
224 Ile Phe Asp Ser Ile Ile Val Ile Leu Ser Leu Met Glu Leu Gly Leu
225              785                  790                  795
227 tcc cgc atg agc aac ttg tcg gtg ctg cgc tcc ttc cgc ctg ctg cgg    2451
228 Ser Arg Met Ser Asn Leu Ser Val Leu Arg Ser Phe Arg Leu Leu Arg
229      800                  805                  810
231 gtc ttc aag ctg gcc aaa tca tgg ccc acc ctg aac aca ctc atc aag    2499
232 Val Phe Lys Leu Ala Lys Ser Trp Pro Thr Leu Asn Thr Leu Ile Lys
233 815                  820                  825                  830
235 atc atc ggg aac tca gtg ggg gca ctg ggg aac ctg aca ctg gtg cta    2547
236 Ile Ile Gly Asn Ser Val Gly Ala Leu Gly Asn Leu Thr Leu Val Leu
237              835                  840                  845
239 gcc atc atc gtg ttc atc ttt gct gtg gtg ggc atg cag ctc ttt ggc    2595
240 Ala Ile Ile Val Phe Ile Phe Ala Val Val Gly Met Gln Leu Phe Gly
241              850                  855                  860
243 aag aac tac tcg gag ctg agg gac agc gac tca ggc ctg ctg cct cgc    2643
244 Lys Asn Tyr Ser Glu Leu Arg Asp Ser Asp Ser Gly Leu Leu Pro Arg
245              865                  870                  875
247 tgg cac atg atg gac ttc ttt cat gcc ttc ctc atc atc ttc cgc atc    2691
248 Trp His Met Met Asp Phe Phe His Ala Phe Leu Ile Ile Phe Arg Ile
249      880                  885                  890
251 ctc tgt gga gag tgg atc gag acc atg tgg gac tgc atg gag gtg tcg    2739
252 Leu Cys Gly Glu Trp Ile Glu Thr Met Trp Asp Cys Met Glu Val Ser
253 895                  900                  905                  910
255 ggg cag tca tta tgc ctg ctg gtc ttc ttg ctt gtt atg gtc att ggc    2787
256 Gly Gln Ser Leu Cys Leu Leu Val Phe Leu Leu Val Met Val Ile Gly
257              915                  920                  925
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259 aac ctt gtg gtc ctg aat ctc ttc ctg gcc ttg ctg ctc agc tcc ttc    2835
260 Asn Leu Val Val Leu Asn Leu Phe Leu Ala Leu Leu Leu Ser Ser Phe
261             930                 935                 940
263 agt gca gac aac ctc aca gcc cct gat gag gac aga gag atg aac aac    2883
264 Ser Ala Asp Asn Leu Thr Ala Pro Asp Glu Asp Arg Glu Met Asn Asn
265             945                 950                 955
267 ctc cag ctg gcc ctg gcc cgc atc cag agg ggc ctg cgc ttt gtc aag    2931
268 Leu Gln Leu Ala Leu Ala Arg Ile Gln Arg Gly Leu Arg Phe Val Lys
269     960                 965                 970
271 cgg acc acc tgg gat ttc tgc tgt ggt ctc ctg cgg cag cgg cct cag    2979
272 Arg Thr Thr Trp Asp Phe Cys Cys Gly Leu Leu Arg Gln Arg Pro Gln
273 975                 980                 985                 990
275 aag ccc gca gcc ctt gcc gcc cag ggc cag ctg ccc agc tgc att gcc    3027
276 Lys Pro Ala Ala Leu Ala Ala Gln Gly Gln Leu Pro Ser Cys Ile Ala
277             995                 1000                1005
279 acc ccc tac tcc ccg cca ccc cca gag acg gag aag gtg cct ccc acc    3075
280 Thr Pro Tyr Ser Pro Pro Pro Pro Glu Thr Glu Lys Val Pro Pro Thr
281             1010                1015                1020
283 cgc aag gaa aca cgg ttt gag gaa ggc gag caa cca ggc cag ggc acc    3123
284 Arg Lys Glu Thr Arg Phe Glu Glu Gly Glu Gln Pro Gly Gln Gly Thr
285         1025                1030                1035
287 ccc ggg gat cca gag ccc gtg tgt gtg ccc atc gct gtg gcc gag tca    3171
288 Pro Gly Asp Pro Glu Pro Val Cys Val Pro Ile Ala Val Ala Glu Ser
289     1040                1045                1050
291 gac aca gat gac caa gaa gaa gat gag gag aac agc ctg ggc acg gag    3219
292 Asp Thr Asp Asp Gln Glu Glu Asp Glu Glu Asn Ser Leu Gly Thr Glu
293 1055                1060                1065                1070
295 gag gag tcc agc aag cag gaa tcc cag cct gtg tcc ggt ggc cca gag    3267
296 Glu Glu Ser Ser Lys Gln Glu Ser Gln Pro Val Ser Gly Gly Pro Glu
297             1075                1080                1085
299 gcc cct ccg gat tcc agg acc tgg agc cag gtg tca gcg act gcc tcc    3315
300 Ala Pro Pro Asp Ser Arg Thr Trp Ser Gln Val Ser Ala Thr Ala Ser
301             1090                1095                1100
303 tct gag gcc gag gcc agt gca tct cag gcc gac tgg cgg cag cag tgg    3363
304 Ser Glu Ala Glu Ala Ser Ala Ser Gln Ala Asp Trp Arg Gln Gln Trp
305         1105                1110                1115
307 aaa gcg gaa ccc cag gcc cca ggg tgc ggt gag acc cca gag gac agt    3411
308 Lys Ala Glu Pro Gln Ala Pro Gly Cys Gly Glu Thr Pro Glu Asp Ser
309     1120                1125                1130
311 tgc tcc gag ggc agc aca gca gac atg acc aac acc gct gag ctc ctg    3459
312 Cys Ser Glu Gly Ser Thr Ala Asp Met Thr Asn Thr Ala Glu Leu Leu
313 1135                1140                1145                1150
315 gag cag atc cct gac ctc ggc cag gat gtc aag gac cca gag gac tgc    3507
316 Glu Gln Ile Pro Asp Leu Gly Gln Asp Val Lys Asp Pro Glu Asp Cys
317             1155                1160                1165
319 ttc act gaa ggc tgt gtc cgg cgc tgt ccc tgc tgt gcg gtg gac acc    3555
320 Phe Thr Glu Gly Cys Val Arg Arg Cys Pro Cys Cys Ala Val Asp Thr
321             1170                1175                1180
323 aca cag gcc cca ggg aag gtc tgg tgg cgg ttg cgc aag acc tgc tac    3603
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VERIFICATION SUMMARY
PATENT APPLICATION: US/10/077,054

DATE: 03/04/2002
TIME: 14:55:08

Input Set : **A:\Sequence.app**
Output Set: **N:\CRF3\03042002\J077054.raw**

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L:11 M:271 C: Current Filing Date differs, Replaced Current Filing Date